SMITHSONIAN
Zoogoer
For members of **FRIENDS OF THE NATIONAL ZOO**
JULY | AUGUST | 2011

Bringing up baby

When animal parents fall short, hand-rearing keepers pitch in.

» **Cephalopod Smarts**
» **Conservation in Kenya**
» ***NEW:* Kids Corner**

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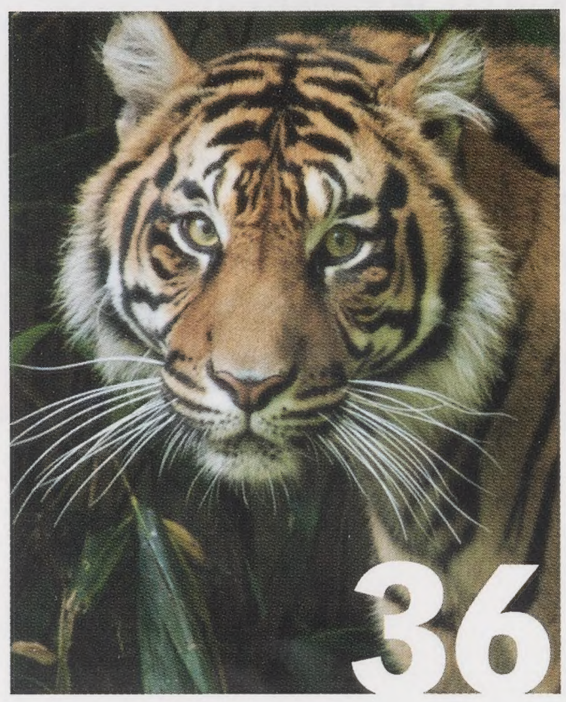

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FONZ Friends of the National Zoo is the dedicated partner of the Smithsonian's National Zoological Park. FONZ provides exciting and enriching experiences to connect people with wildlife. Together with the Zoo, FONZ is building a society committed to restoring an endangered natural world. Formed in 1958, FONZ was one of the first conservation organizations in the nation's capital.

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On the cover: A keeper holds a young red panda.
PHOTO BY MEHGAN MURPHY/NZP

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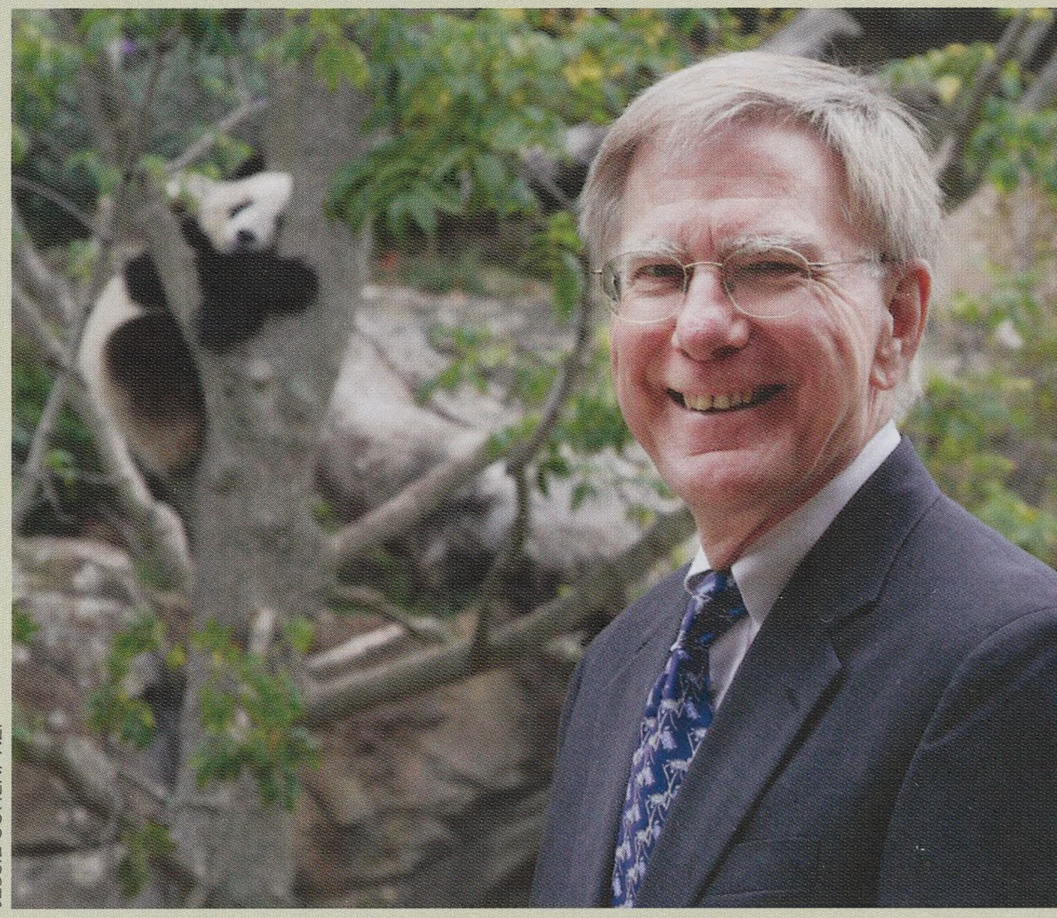
A PLACE TO GROW


JESSIE COHEN/ NZP

EVERY YEAR, MORE THAN TWO MILLION VISITORS COME TO THE ZOO. While I can speak personally to only a small number of all our visitors each year, I always notice the joy and excitement of our guests when they visit the Zoo. Whether they are startled into laughter by the braying of the zebras or confounded by the strength and agility of the orangutans as they cross high above Olmsted Walk, visitors often share their experience collectively by their laughter or their *awww* sounds.

After a day at the Zoo, we think back to the many amazing things we've seen and felt. We've marveled at species so different from ourselves. We've discovered a few more of the wondrous adaptations that have played out over eons of life on Earth. And, in the process, we have grown, perhaps even becoming a bit more human, ironically, by better understanding and appreciating that which is not human.

We all observe the magnetic appeal the Zoo has for children, families, and animal lovers of every age. Frankly, I wish there were more time to interact with our visitors. Our animal care staff, our FONZ employees, our volunteers, and our support teams are all dedicated to their tasks of caring for the animals, meeting visitor needs, and telling the story of the magnificence of the natural world and its precarious position with regard to its survival.

Through the pages of *Smithsonian Zoogoer,* we come into your home and take you into ours here at the Zoo. On these pages, we share many of the stories you may otherwise never hear.

We are pleased to launch a newly refocused *Zoogoer* section called Kids Corner. As you have suggested, we have added more color, more interest-grabbing facts, and more child-friendly activities. We hope that readers of all ages will enjoy it!

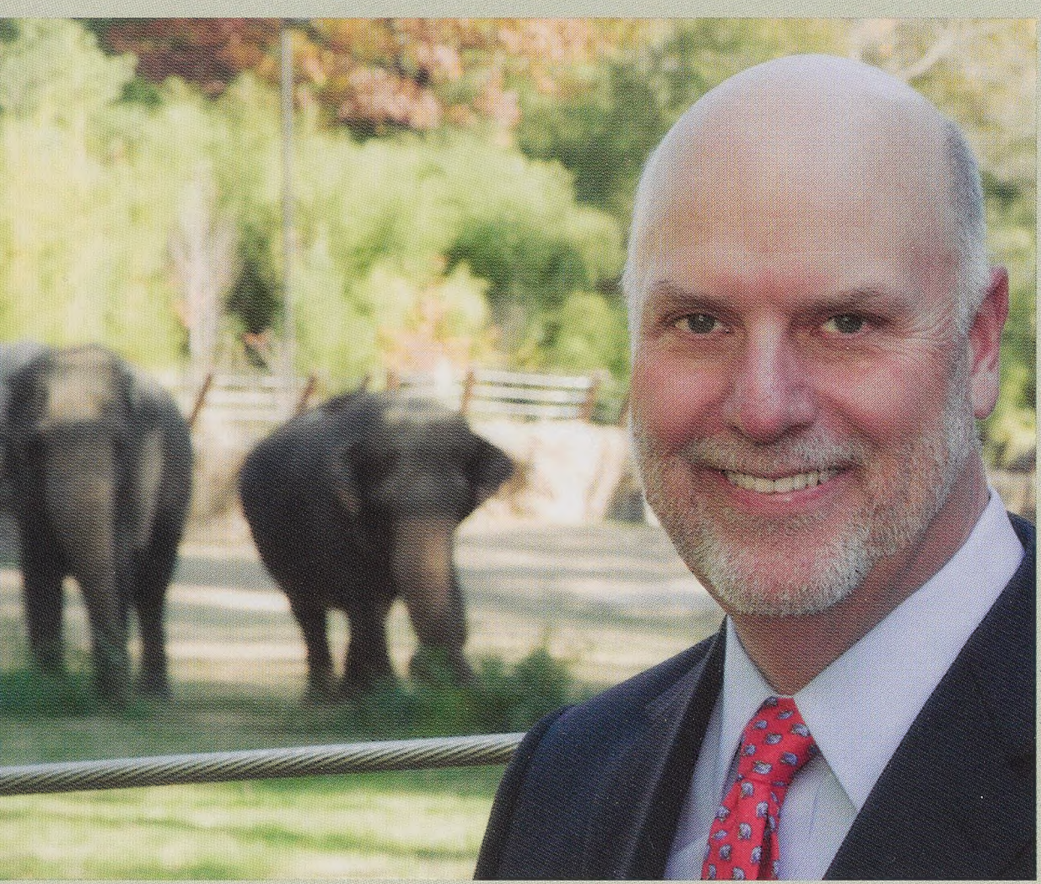
We also care about your views on your FONZ membership. You'll soon be invited to participate in an online FONZ membership survey. We are looking for your views on how we can continue to strengthen our membership program. Thanks in advance for your participation.

Sincerely,

Bob Lamb

Bob Lamb
Executive Director, Friends of the National Zoo

SAFETY: A SHARED RESPONSIBILITY



MEHGAN MURPHY/NZP

LOOKING FOR A SAFE PLACE TO BRING THE FAMILY? COME TO THE ZOO. A recent study found that a zoo accredited by the Association of Zoos and Aquariums (AZA) is one of the safest public places to spend time. That news didn't surprise me, because I'm keenly familiar with both the rigors of AZA accreditation and with the importance that zoo teams across the country place on safety.

At the Smithsonian's National Zoological Park, safety is a threefold challenge. The animals need to be kept safe. The visitors need to be kept safe. And the staff need to be kept safe. Ensuring that they are all safe is a tremendous responsibility—one shared, I believe, by both Zoo staff and Zoo visitors.

For our part, the Zoo staff take safety incredibly seriously. As you may know, the Zoo has its own police force, charged with ensuring safety within our 163 acres of exhibits and parkland at Rock Creek and our vast research and breeding center in Front Royal. The Zoo also has a dedicated safety officer and a cross-departmental safety task force. They work to ensure that both the physical setting and human behavior create a safe environment for the thousands of people on our premises each day.

Despite our best efforts, however, safety is sometimes breached. We saw this on Easter Monday, when two young people got into a fight on the Zoo grounds, and one stabbed the other. Several juveniles were arrested in connection with the incident, and the victim was hospitalized. The Zoo Police worked swiftly to regain control of the grounds, temporarily halting the flow of people into the park until crowd levels were manageable.

Needless to say, we hope never to see a repeat of that attack. Toward that end, the Zoo Police are redoubling their efforts to coordinate with the Park Police and the Metropolitan Police Department to provide the best possible coverage of the Zoo and its surroundings. And the Zoo's leadership team is exploring ways to better manage crowding in the park. One question we're considering, for instance, is whether to require chaperones for young visitors to the Zoo.

At the same time, we urge Friends of the National Zoo members and our faithful visitors to join in our safety efforts by modeling safe behavior for other patrons. Your positive peer pressure can create an environment where the prevailing ethos is one of respect—for the animals (and the boundaries of their enclosures), for other visitors, and for the staff. We also ask that you report anything that seems amiss to the Zoo Police or to a member of the Zoo or FONZ staff.

Together, we can ensure that safety reigns at the National Zoo!

Sincerely,

Dennis Kelly
Director, Smithsonian's National Zoological Park

Clouded Leopard Cubs

The Smithsonian Conservation Biology Institute (SCBI) headquarters in Front Royal welcomed two clouded leopard cubs on March 28. The cubs, a male and female, were born to Sita (a first-time mom) and Ta Moon. The cubs are being hand-reared by SCBI staff.

Hand-rearing the cubs is rigorous. Until the cubs were two weeks old, they were bottle-fed seven times each day, and that responsibility was taken on by only two keepers. The bigger the cubs get, the fewer bottle feedings they will require. And more keepers can shoulder the responsibility of feeding them.

At almost three weeks old, both cubs had opened their eyes and were starting to show their personalities. Keepers have observed that the male is the more relaxed of the two. The female cub is a fussier eater and likes sitting on top of her brother in their nesting crate.

When the cubs turn six months old, they will be placed with potential mates. Introducing clouded leopards to potential mates while they are still cubs greatly reduces the likelihood of male aggression toward females when the cats are old enough to breed.

SCBI has been improving clouded leopard care since the late 1970s and has celebrated the birth of 70 cubs over the years. All of those cubs have helped boost genetic diversity in the captive population of these endangered cats. SCBI hopes to continue its success with breeding clouded leopards within a new facility, which will include a large climate-controlled indoor area and a large outdoor yard with structures that will allow the cats to climb as they do in their jungle habitat.

UPDATE: *A third cub was born just before press time. We will have details in the next issue.*

MEHGAN MURPHY/NZP

MEHGAN MURPHY/NZP

Naming an Anteater Pup

Zoo staff came up with a novel way of naming the newest anteater pup: They asked mom. The process started with five names chosen by keepers. Visitors to the Zoo's website voted on the names, choosing three finalists: Demetrio, Fausto, and Pablo. That's where the pup's mother, Maripi, came in. Keepers set out three treats, hidden under flower pots, in Maripi's yard. They attached a name to each pot. She went first to the pot marked Pablo, thus bestowing that name on her pup. Maripi was the first Zoo animal to name her offspring in this way.

MEHGAN MURPHY/NZP

Wattled Crane Hatches

A wattled crane chick, only the third in the Zoo's history, hatched at the Bird House on March 20. Keepers are pleased with the chick's progress so far and with the care its parents are providing. "It's doing really, really well," says former bird curator Dan Boritt.

The chick will grow up to be six feet tall with white plumage and a large wattle hanging below its beak. When it has fully matured, the chick will help build a captive population of the majestic birds. A Species Survival Plan recommendation will determine where the chick will go to breed and when.

For now, though, the chick is staying with its parents until at least late summer. "They will raise it for several months, and it will be a judgment call for when we separate them," explains Boritt.

MEHGAN MURPHY/NZP

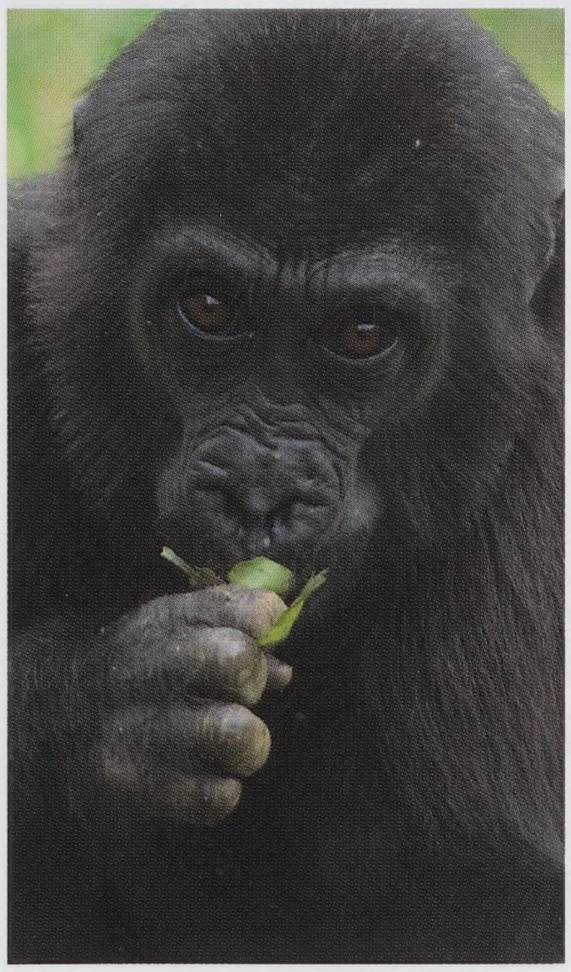
MEHGAN MURPHY/NZP

Recycle Your Electronics

Have an old cell phone, laptop, MP3 player, or other electronic gizmo that's just amassing dust? Drop it off at the Visitor Center information desk or in the new container at the Great Ape House. FONZ will send the items to our partner ECO-CELL, which refurbishes electronic devices for reuse or disposes of them safely. (Electronics contain any number of metals and chemicals, including arsenic, that should not wind up in landfills.) FONZ then receives a donation to support conservation efforts.

Recycling electronics has another important benefit. Producing cell phones and other devices requires a metallic ore called coltan. Large deposits of it have been found in gorilla habitat. Retrieving coltan from used electronics lessens the demand for new ore, reducing the likelihood of destroying habitat for mining.

You can learn more at nationalzoo.si.edu/visit/recycling.cfm.

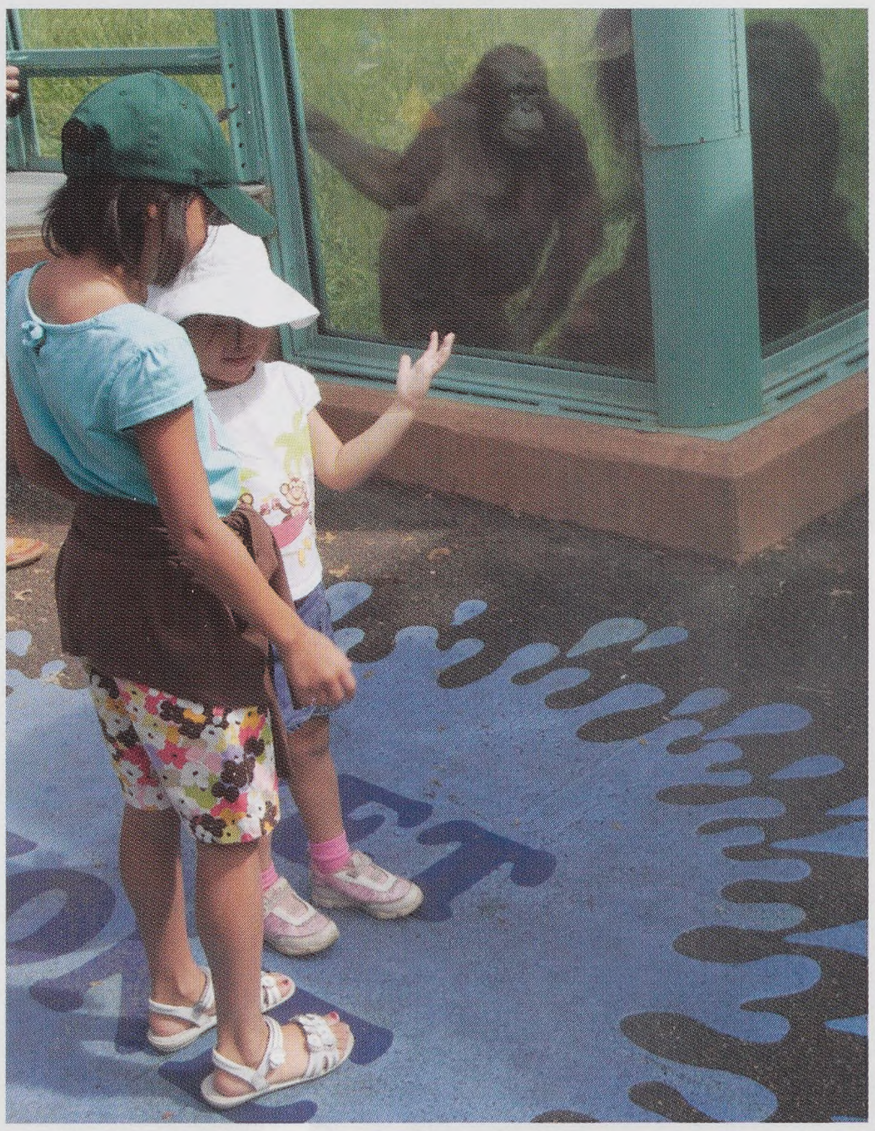


MEHGAN MURPHY/NZP

MEHGAN MURPHY/NZP

New Otters on Asia Trail

The new male and female Asian small-clawed otters that arrived at the Zoo in early March are now on exhibit. Visitors can see them on Asia Trail. After carefully arranged introductions, keepers have placed the otters together in hopes that they will become a mated pair.



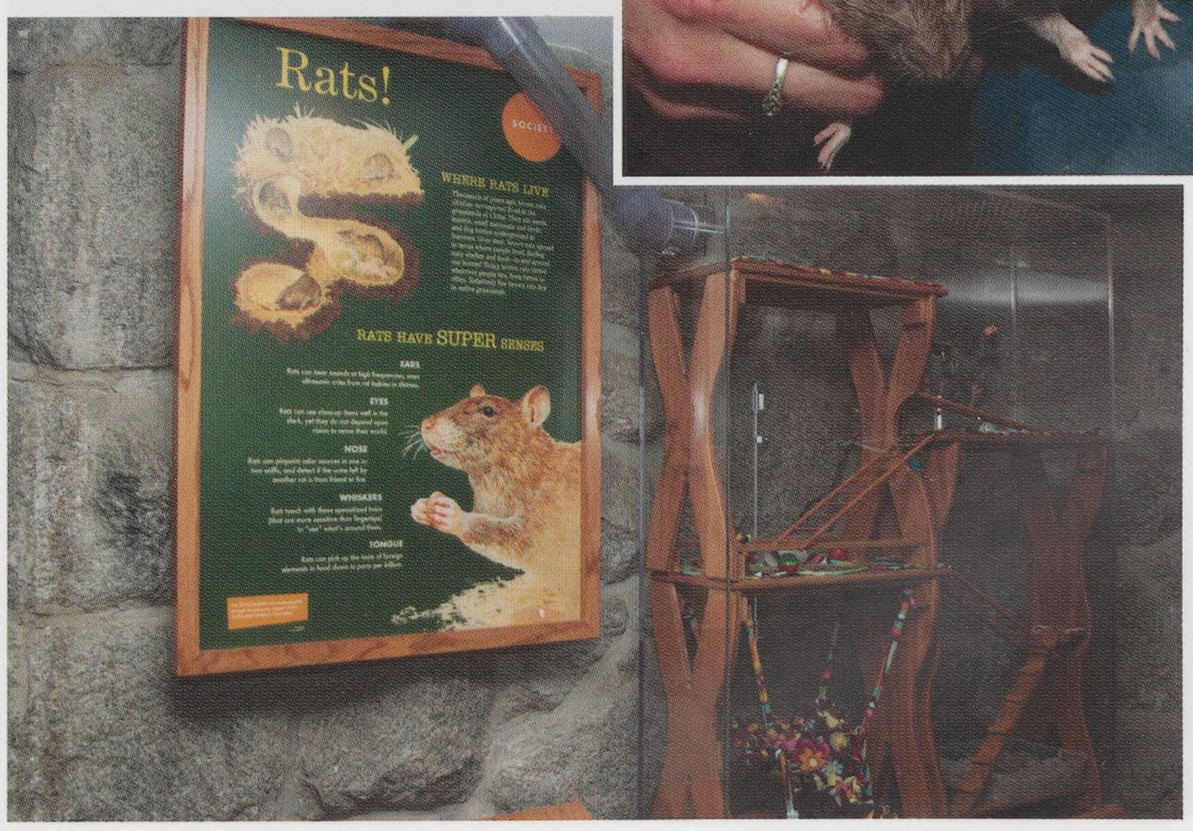
MEHGAN MURPHY/NZP

Think Tank Update

New enhancements at Think Tank make life more interesting for orangutans—and visitors. The orange apes can now play tug-of-war with visitors or douse a guest with a shower. (Shower zones are marked, so you won't get drenched unexpectedly.)

Think Tank also has new residents: a trio of Norwegian brown rats. Highly intelligent, the rodents navigate mazes as they race around the exhibit. A memory test at the end of the exhibit allows visitors to see how their abilities match those of orangutans and rats.

MEHGAN MURPHY/NZP



MEHGAN MURPHY/NZP

You Are Smarter Than a Curator!

The online quiz "Are You Smarter than a Curator?" showed that enrichment curator Heidi Hellmuth has some competition. She provided challenging questions about how Zoo staff work to stimulate animals and encourage their natural behaviors across the Zoo. For each question answered correctly on the five-question quiz, the National Zoo won ten cents for conservation efforts. After a month, those dimes started to add up, and the Zoo earned $7,190 for conservation! The enrichment program also earned $1,090 in generous donations, allowing Hellmuth to purchase more of the animals' favorite toys.

MEHGAN MURPHY/NZP

Busy Bird

MEHGAN MURPHY/NZP

The National Zoo is the only institution in the country that houses coastal plain swamp sparrows. Over the past 7,000 years, these tiny birds have been adapting from a freshwater habitat to saltwater coastal marshes, giving scientists an unprecedented chance to study evolution. This fast-tracked change is pushing scientists to study more about the birds and to determine if more than one subspecies of the coastal plain swamp sparrow exists.

One of the Zoo's sparrows has been surprising keepers and scientists by laying fertile eggs outside of breeding season. She laid a clutch last December, another in February, and a third in April. All the eggs hatched, yielding chicks that weighed half a gram each.

Sadly, none of the chicks has survived—yet. Chicks from the first two clutches died within three days of hatching. So did most of the chicks from the third clutch. One, though, made it to day 13, fledging and flying about the enclosure. That gives Zoo staff hope that a sparrow chick will someday soon survive and thrive into adulthood.

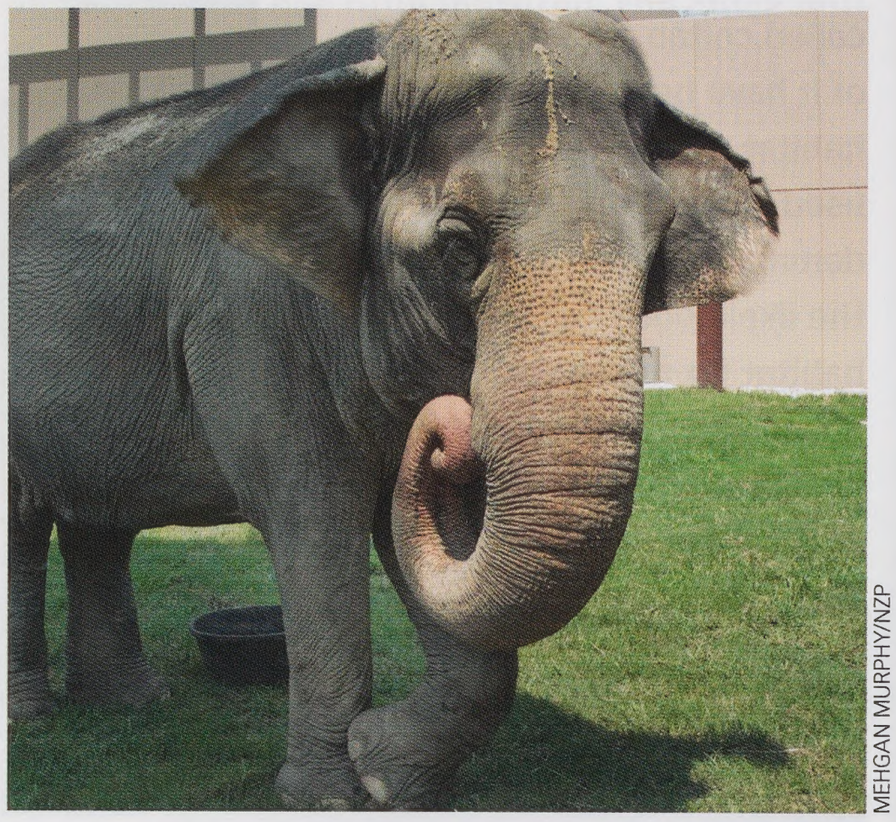
Mark Your Calendar

July 14 **Brew at the Zoo**
Support wildlife conservation by sampling local beers. See ad on inside of back cover.

Aug. 10 **Rock-n-Roar**
Come hear the B-52s! See ad on p. 33.

Sept. 18 **Fiesta Musical**
Celebrate Hispanic Heritage Month from 11 a.m. to 5 p.m. by listening to music, watching costumed dancers, buying craft products, and enjoying Latin American food—all at our free festival.

Sept. 22 **Grapes With the Apes**
Sample fine wines while learning about and supporting ape conservation. Learn more at **fonz.org/grapes.htm.**



MEHGAN MURPHY/NZP

Behind the Scenes With Elephants

Elephant enthusiasts now have the rare opportunity to see the new elephant barn. FONZ guides will give tours of the state-of-the art-structure on Wednesday and Sunday mornings at 8:15. The tour will give visitors a look at how the National Zoo cares for its Asian elephant herd.

Tours cost $40 a person. Children two years old and younger are free. Proceeds will go toward purchasing enrichment items for the Zoo's elephants, Ambika, Shanthi, and Kandula.

To learn more, please contact Caroline Winslow at 202.633.3057.

MEHGAN MURPHY/NZP

Colorful Clams

Visitors to the Invertebrate Exhibit are in for a giant, colorful treat. Ten iridescent giant clams now live in the coral exhibit. "The giant clam is an iconic South Pacific reef invertebrate, and this particular species is absolutely beautiful," says animal keeper Mike Henley. Although the clams are much larger than the clams for sale at the fish market, they are the smallest species of giant clam. The clams are estimated to be three or four years old, and they range in size from three to six inches. When they are fully grown, they will be nine inches across.

The clams have iridescent mantles that appear to change color depending on the angle at which visitors peer into the tank. The giant clams are stationary, but that does not mean they don't move. Occasionally the invertebrates open their mantles and then "clam" up. The sudden movement looks like a flower blooming and closing.

The giant clam's impressive size and colors have attracted the attention of fishing crews. They harvest the clams from the warm waters surrounding coral reefs for their meat, shells, and use in aquariums. An even bigger threat is destruction of the clams' coral reef habitat. Reefs are struggling to cope with rising ocean temperatures, among other threats. "If we lose coral reefs, this is one of the beautiful denizens we could lose," says Henley.

MEHGAN MURPHY/NZP

Farewell to Hiri

Hiri, the first female kiwi ever hatched at the Zoo, left for her new home in Germany on May 11. Born in 2010, she charmed visitors to the kiwi cam on the Zoo's website. Unfortunately, Hiri's departure leaves the kiwi cam without a star. The Zoo's adult kiwis are too large for Hiri's enclosure. So the kiwi cam will be offline until the Zoo has a new chick.

MEHGAN MURPHY/NZP

Cephalopods are the most intelligent invertebrates in the world.

Chambered nautilus

MEHGAN MURPHY/NZP

brains OVER BRAWN

BY DEVIN MURPHY

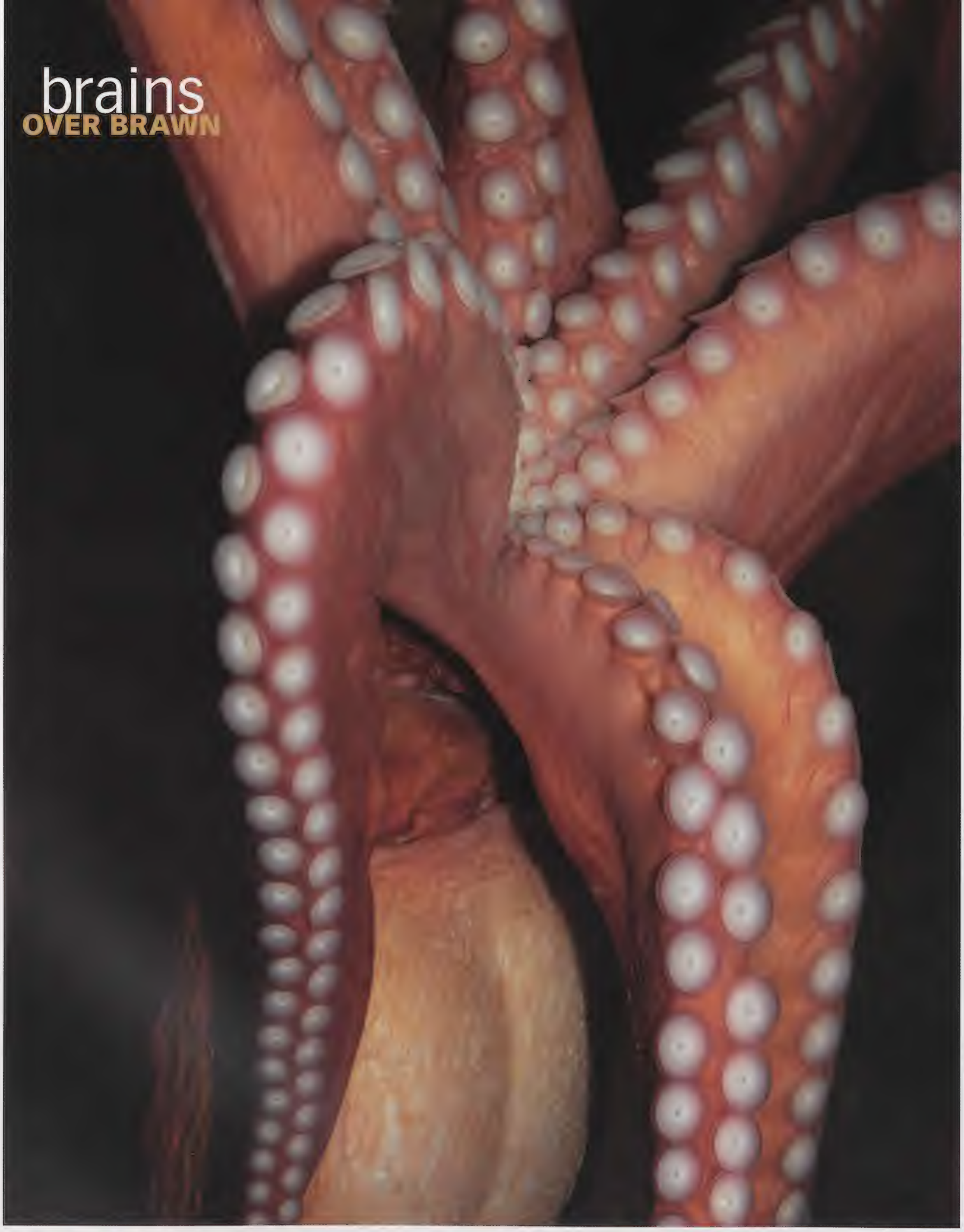
"Most people don't think of invertebrates as smart," says Alan Peters, the National Zoo's invertebrates curator. Perhaps it's time to think again, with minds stretched by a visit to the Invertebrate Exhibit. There, you'll encounter two famously smart species: the giant Pacific octopus and the common cuttlefish.

They are among more than 700 species in the class Cephalopoda, a group that also includes squid. These marine animals tend to have soft, fleshy bodies; tentacles or arms; keen vision; and hard, birdlike beaks. Some have shells; many don't. They move by jet propulsion, squirting water through tubes known as siphons. Their brains, roughly the shape of doughnuts, are the largest of any invertebrates.

Busy Brains

Keeping those big brains busy can be a challenge for Zoo staff. Cuttlefish and octopuses are capable of learning and retaining information. They can solve puzzles and navigate mazes. Experiments with cuttlefish and octopuses have shown that they can learn to navigate a maze with more than one exit by interpreting simple visual cues, such as a purposely placed object. They can remember which object is associated with which exit and which direction to swim to the exit.

Such intelligent animals need plenty of activity to keep them stimulated. Keepers maintain a varied schedule of enrichment



MEHGAN MURPHY/NZP

The Zoo takes extra precautions to ensure that Octavius cannot slide open the top of his tank and escape. Since the only hard part of his body is the beak, which is about the diameter of a quarter and hidden behind his arms, **he can fit through any space that is larger than a quarter.**

exercises. Octavius, the Zoo's giant Pacific octopus, has an enrichment program that encourages his natural curiosity. Keepers regularly switch enrichment items so he does not get bored. Since he is capable of learning, keepers give him puzzles to figure out. He may have to manipulate a toy, box, or jar a certain way to get a reward hidden inside.

Biologist Tamie DeWitt carefully observes the reaction Octavius has to each enrichment object. She is looking for any preference that Octavius has—for, say, a red toy or a blue one. That information helps keepers design an enrichment program that is especially stimulating for him.

Octopuses' natural inquisitiveness does not end with objects in their tanks. "The most interesting thing an octopus can do is get out of its tank," says DeWitt, "but that's usually a very bad thing." These skilled escape artists can get out of their tanks easily if a lid is not secured properly or they are provided with even the smallest opening.

The Zoo takes extra precautions to ensure that Octavius cannot slide open the top of his tank and escape. Since the only hard part of his body is the beak, which is about the diameter of a quarter and hidden behind his arms, he can fit through any space that is larger than a quarter.

Although octopuses can survive out of water for short periods of time, they risk death if they venture out of their environments. "Usually if they are going to get out of a tank they're not going to be able to make it back and survive," explains DeWitt. Even if an octopus made it to another tank, the animal could not survive in water that is not the correct temperature, chemical composition, and pressure.

Playing With Food

Keeping cephalopods engaged—and in their tanks—is only part of the challenge of looking after these intelligent animals. Feeding them is another. Being predators, cephalopods crave live prey. In the wild, they pounce on food—snatching it with their tentacles and gobbling it up.

This means keepers cannot simply dump crayfish into cephalopods' tanks. The animals will not search the bottom, looking for scraps of food. Zoo staff need to make sure that cephalopods see and smell food—and eat it right away. Otherwise, it falls to the bottom and decomposes, contaminating their water.

Young cuttlefish flatly refuse to eat anything but live prey, so the Zoo obtains it for them. Doing so is a logistical nightmare, however, so keepers wean the young cephalopods as soon as possible. "When they grow up, we train them to eat frozen prey from a stick. It can take hours and hours, and that is why we love our volunteers," says DeWitt.

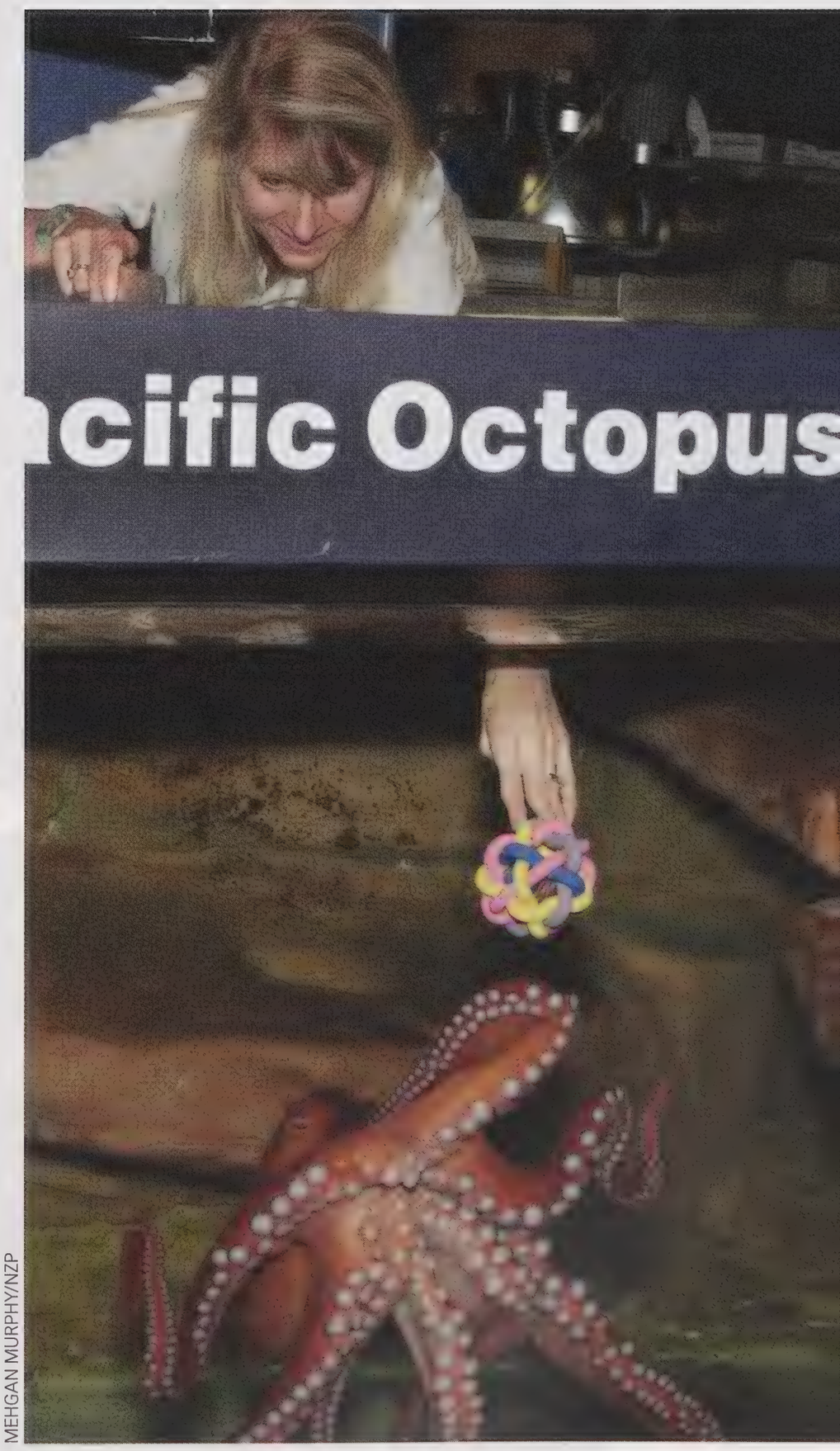
The hardest part about feeding the juvenile cuttlefish, weaned off of live prey, is finding them. The cuttlefish camouflage themselves and hide among the pebbles in their tanks. To spot them, keepers look for the distinctive, silvery, W-shaped eyes that protrude slightly from the pebbles. They then dangle a succulent piece of shrimp on a stick, luring the cuttlefish to shed their masterful disguises.

Cuttlefish have excellent eyesight, and when they see their food, they emerge from their hiding places. After they have readied themselves to attack, they strike. They seize their food with their tentacles and pull it into their beaked mouths.

Chambered nautiluses hunt in the wild by gliding shell-first through the water. They sweep prey into their mouths with their tentacles. At the Zoo, they react instantly to the smell of shrimp in their tank. As the nautiluses move around excitedly, keepers literally hand-feed them, holding pieces of frozen shrimp within reach of a nautilus's tentacles until the animal grabs and eats the shrimp. While doing so, keepers take care to keep their fingers away from the cephalopods' sharp beaks!

The Zoo's giant Pacific octopus is not quite so coddled when he is fed. Feeding time is also playtime for Octavius. Like cuttlefish, octopuses are extremely intelligent and curious. They have excellent eyesight and smell, so keepers make them work for their food. A tantalizing shrimp on a stick is just the ticket.

"We shake the stick so he thinks it's a live piece of prey," says DeWitt. "His natural instinct is to grab it and hold on to it." Octavius then plays a game of tug-of-war with the keeper. "You will never win a tug-of-war with an octopus," says DeWitt of the game. So when keepers give up, they



MEHGAN MURPHY/NZP

Biologist Tamie DeWitt offers a toy to Octavius, the Zoo's giant Pacific octopus.

Common cuttlefish

JESSIE COHEN/ NZP

Feeding time for a young common cuttlefish

JESSIE COHEN/ NZP

relax the stick. That signals to Octavius that it is time to let go.

Disguises in the Deep

How did cephalopods get so smart? One theory has to do with the fact that many of them, such as octopuses, cuttlefish, and squid, do not have shells. That meant their brains had room to grow. Another theory is rooted in cephalopods' remarkable camouflage abilities. Changing their appearance at will requires a huge amount of brainpower.

The enrichment program for the cuttlefish is designed to let them use their unparalleled camouflage skills. Cuttlefish are very responsive to stimuli, so keepers have an arsenal of things they can do to get their colors flashing. "We put objects in the tank," says DeWitt, "like plants and tunnels and corals. And sometimes we do different lights around the tank, like Christmas lights. Sometimes we'll put pictures in there, or a hamster ball with live crayfish."

In the wild, camouflage acts as a defense mechanism. Rather than solely relying on

the cover of an ink cloud (squid, octopuses, and cuttlefish have ink sacs) to escape predators, cephalopods depend on their ability to change their appearance in seconds.

Octopus and cuttlefish skin is covered in chromatophores, or bundles of pigment. They contain red, yellow, orange, black, and brown pigments. Controlled by nerves, chromatophores are activated when muscles contract. Color spreads out across a cephalopod's entire body.

Cephalopods have other camouflage tools too. Their skin is also covered with iridophores, which reflect colors in the environment. Cephalopods can also change the texture of their skin with tiny projections called papillae. They make the animal resemble a rough surface, such as hard coral. Ironically, given cephalopods' painterly use of color, the animals are themselves color-blind.

Mating Maneuvers

In addition to their defensive duties, colors and patterns play important roles during breeding. Take cuttlefish, for example. They live only about a year, so breeding is a very intense and important time. At the Zoo, cuttlefish are housed together only when they are very young or for breeding. But after mating, keepers separate males and females. "It can be pretty quick," says DeWitt of the time cuttlefish are put together to breed. "We usually don't leave the male and female in together because he'll just harass her." The Zoo has bred three generations of cuttlefish and currently has four juvenile cuttlefish.

In the wild, having such a short time to pass on genes makes breeding a coveted activity. Colors and patterns help cuttlefish communicate with each other when they are ready to breed. Breeding often involves competition for mates, which can require a male cuttlefish to say two things at once: "Keep away!" to other males and "Pick me!" to females. "It can literally split its body in half and change colors, presumably warding off one and attracting the other," says Peters.

Even without male competition, the mating display is still a colorful sight to see. "It's the patterns," explains DeWitt. "The male, he spreads himself out to make himself look real big and does a real distinct zebra pattern. He does this thing called a passing cloud where he takes this stripe and spreads it out along his entire body. It looks really neat."

If a male cuttlefish is not large enough to impress a female, he still has another option for wooing her. Large male cuttlefish guard their potential mates from other males, but cuttlefish are masters of disguise. A smaller male may try slipping past an aggressive larger male. "Sometimes the male will try to look like a female so he won't have to do the bright colors and sparring behaviors, and take the aggression of another male," explains DeWitt. "He'll just be subservient."

While under the guise of an unassuming female, the smaller male will approach the guarded female and mate with her. He can then slip away without the larger male ever becoming the wiser. There is evidence that females favor such resourcefulness and choose to fertilize their hundreds of eggs with packets of sperm passed to them from cross-dressing males during mating rather than the sperm of larger males.

Other cephalopods are harder to breed in captivity. In all the years the Zoo has had octopuses in its collection, a female has only laid a clutch of eggs once, and they were not fertile. Also, octopuses are solitary animals. There is no definite way for keepers to predict what will happen if two octopuses are put in the same tank. "They mostly live on their own and when you put them together, they may mate or they may fight," says Peters.

The chambered nautilus has never been bred successfully in captivity. "We have had nautilus eggs, but we have not successfully hatched them out," says Peters. Scientists have also not been able to collect much information about how nautilus eggs are laid and develop in the wild because they have never been observed in the wild.

Cephalopods in the Wild

The precise status of many cephalopods in the wild is not known exactly, but these invertebrates are not believed to be under any imminent threat. The giant Pacific octopus, common cuttlefish, and chambered nautilus are not classified as endangered or vulnerable. "Right now I think they are more collected for food and shells," says Peters.

Their stable status means that there are plenty of opportunities to learn more about these intelligent, spineless wonders in the future. New species are still being discovered in deeper, less accessible waters, adding to their mystique and intrigue. Watching the cephalopods at the Zoo, it is easy to wonder: Is the ocean still concealing its most intelligent cephalopod? SZ

— DEVIN MURPHY *was an editorial intern for* Smithsonian Zoogoer.

Caring for Cephalopods

Keeping cephalopods in captivity poses significant habitat challenges. The biggest challenge when caring for any marine animal in captivity is recreating its natural habitat. At the Invertebrate Exhibit, the aquariums that the cephalopods live in have to be meticulously maintained. The water temperature must be just right.

Even more important than the temperature is getting the chemical composition of the water right. At the Zoo, there is no seawater on hand, and there is no ocean current to act as a natural filter in a tank. "So it's up to us to refresh that water and check the chemical composition," says invertebrates curator Alan Peters.

Keeper Mike Henley tests water for the Invertebrate Exhibit.

Raising Babies By HAND

BY KERRY GILDEA BECK

Sometimes, animal parents aren't up to the job. Then a hand-rearing team steps in.

JESSIE COHEN/ NZP

Newborns at the Zoo may look cute and cuddly, but many have razor-sharp claws, fierce fangs, and tricky temperaments.

And some of the moms may neglect or even kill their babies rather than nurse or care for them. That's when Zoo experts with some real hands-on experience step in.

Some of the Zoo's infants must be "pulled," or taken away from their mother after birth, to survive. A new mother may not always harm a newborn, but often she simply cannot provide what it needs. The specialized staff who care for the Zoo's babies have paved the way in raising exotic birds from Africa and New Zealand, clouded leopards and red pandas from Asia, and even one prickly little South American porcupine.

Hand-rearing an animal infant is akin to the initial weeks of caring for a human baby. Some days are joyful; others are filled with fear and worry. Feeding routines can be erratic. There are too many sleepless nights to count.

Porcupine Problems

Dell Guglielmo, a keeper from the Small Mammal House, knows the drill well. In August 2009, time was running out for a tiny newborn prehensile-tailed porcupine named Clark. Just days after his birth, he

MEHGAN MURPHY/NZP

ABOVE: **A prehensile-tailed porcupine snacks on a bit of fruit.**
PRECEDING PAGE: **Keeper Jilian Fazio tends to a red panda cub.**

seemed weak. Two weeks later, the little guy still refused to eat, and prospects for his survival were bleak. Guglielmo says she and Stacey Tabellario, a keeper now at Asia Trail, worked tirelessly with the Zoo's Department of Animal Health, but weren't seeing any improvement from the little ball of rust-colored hair just starting to form quills.

Soon after Clark was born, Guglielmo had realized something wasn't right. These nocturnal animals nurse for very short periods, making it next to impossible to monitor nighttime nursing. But Clark wasn't gaining weight and was growing weaker every day. He was medicated for an intestinal problem, and his keepers needed to get him to eat somehow—and fast. From the start, they knew handling a porcupine was not going to be easy.

"Normally in hand-rearing you'd hold the baby animal in a blanket or cradle it like a mother would hold a human baby, but that's a real challenge when you're dealing with a porcupine," Guglielmo says. "That's not how they nurse and it's not natural for them."

When porcupines nurse, the mother and the baby stand up, facing each other. It almost looks like they're playing patty-cake before the baby moves underneath to get at the milk. Trying to replicate this routine, Guglielmo brought in a wooden perch that she used to show off porcupines for Zoo visitors. She hoped Clark would sit on the perch so she could feed him formula with a syringe. The perch worked well enough, but he still wasn't interested in eating. Then a little bit of banana saved the day.

Adult porcupines love banana, and Clark did too. When Guglielmo and the Zoo nutrition staff added some banana to his formula, Clark finally turned the corner. To accommodate his growing teeth, they also designed an extra thick nipple for his bottle. Guglielmo's life went on hold for almost two months, but she says she'd do it all again in a heartbeat.

"I had no idea how labor-intensive it could be taking care of this guy," Guglielmo says, feeding Clark, now a healthy two-year-old, a slice of his favorite yellow fruit. "The effort to help him survive involved curators, keepers, veterinary staff, nutritionists, and even the Zoo police who opened the gates for us in the middle of the night. "Today he's doing great, and he still loves his bananas."

MEHGAN MURPHY/NZP

JESSIE COHEN/NZP

ABOVE: **A veterinarian examines a clouded leopard cub.**
LEFT: **Keeper Dell Guglielmo tends a young prehensile-tailed porcupine.**

Caring for Cats

In the porcupine's case, the Zoo staff stepped in to save an individual animal that was sick and needed special care, but hand-rearing also is a component of larger efforts to save endangered species around the world. For example, today all of the clouded leopards born in North America are hand-reared.

Clouded leopard mothers often either ignore or hurt their cubs, and in either case cubs can die, explains Kenneth Lang, senior mammal keeper at the Smithsonian Conservation Biology Institute (SCBI) headquarters in Front Royal. Lang is an expert at hand-rearing. Through it, he says, the Zoo can maintain a captive population of these endangered animals who "become ambassadors for their parts of the world where conservation is very badly needed." Clouded leopard infants have a 47 percent survival rate, which soars to 99 percent if the cats are hand-reared. Over the past 30 years, SCBI has been responsible for more than 70 clouded leopard cubs.

Clouded leopards are also shy and very easily stressed. But through the hand-rearing process, barriers come down, and keepers have an easier time managing and breeding the cats. "We can actually sit in the enclosure like a piece of furniture when they interact with each other," Lang says. "That allows us to head off aggression and at the same time not distract the cubs from interacting with each other."

Strict protocols are in place to ensure an animal does not become too "imprinted" on a human and then is not able to relate to its own species or breed later on. "We feed them, burp them, and put them back to sleep," Lang says. "We don't try to make them pets. We've done generations of hand-rearing, and we've never had a breeding problem with the clouded leopards."

Acknowledging there is a high "cute factor" in handling baby animals, keepers stress they never handle the cubs for the sake of handling them. "We're not doing this because we want to or because they're cute," says former keeper Jilian Fazio, who has hand-reared a number of clouded leopards, red pandas, and leopard cats. "This is what the species needs to maintain a sustainable captive population. Every animal is so important, and much of what we learn from them is critical to their survival and management in the wild."

Aside from a sniff or two around the enclosure or nest boxes, animal moms rarely notice the babies are removed. The human handlers tend to show more of a reaction and aren't shy about bragging about the new kids. "When the cubs are first born, every time we pull them it's emotional," says Jessica Kordell, a member of the clouded leopard team. "Each time it's a different experience, and their personalities are so different. We learn what's special

MEHGAN MURPHY/NZP

MEHGAN MURPHY/NZP

TOP: **A keeper hand-feeds a kori bustard chick.**
BOTTOM: **A freshly hatched brown kiwi rests after the massive effort of breaking its shell.**

about each one. It's amazing how quickly they learn."

The cubs are very particular about who's taking care of them, and they don't like change. The more experienced members of the staff start the process, and newer members rotate in during the weeks that follow so the animals follow the same routine over a six-to-nine-month period.

Bird Breeding

In some parts of the Zoo, hand-rearing starts long before the baby arrives. "Hand-rearing starts the day we bring the egg downstairs to the incubator," says Sara Hallager, who has hand-reared about 50 kori bustard chicks at the Bird House since the first one hatched here in 1997. "We treat that egg like it's the new chick."

Kori bustards are the world's heaviest flying birds, with males weighing up to 18 kilograms. They are native to the grasslands of eastern and southern Africa. There are 25 species of bustard, most of which are in decline.

Hallager and other keepers monitor a kori bustard egg for 21 days, controlling heat and humidity because large fluctuations can be lethal. Around day 23, the egg starts rocking, and a chick, no bigger than 100 grams, breaks out—wet and exhausted. Next the chick is moved to a brooder box, where a feather duster temporarily replicates a mom. Twelve hours later, it's time for a first feeding of crickets along with watermelon for good hydration.

The Association of Zoos and Aquariums has honored the Zoo's work raising koris. Hallager hopes the lessons learned from the koris can be applied to other varieties of large bustards—such as the great Indian bustard, estimated to have a mere 300 remaining in the wild.

"Koris are an indicator species of what's happening in the savanna ecosystem," she says. "The world's largest flying birds can tell a great story of Africa, where illegal hunting and habitat loss are a threat to all species."

In New Zealand, kiwi parents bring new meaning to the term "empty nester." They have nothing at all to do with their chicks. "Kiwi parents don't rear their young," explains keeper Kathy Brader, who hand-rears kiwis. "Leaving the young with the

A red panda cub gulps down a meal.

MEHGAN MURPHY/NZP

Strict protocols are in place to ensure an animal does not become too "imprinted" on a human and then is not able to relate to its own species or breed later on.

parents can be quite dangerous because the parents can kill them in about three or four days. In the wild they tend to live in family groups, but the babies move to a different territory from their parents early on. And they're really helpless when they hatch."

Typically an enormous kiwi egg is pulled from beneath the father, who sits on the egg instead of the mother. After the chick hatches, it's placed in a special isolette box padded with soft towels. The little chick snuggles there until it's able to stand and walk, about six days later. Next the kiwi is moved to a brooder box. Getting the right food mix can involve a lot of trial and error, says Brader, noting that one chick she cared for ate much better when a bit of canned dog food with gravy was added to the menu.

New Zealand's Operation Nest Egg program is one of the most successful efforts in the world to save a species, Brader notes, adding that she hopes people learn the kiwi's story from the work being done here. Even many New Zealanders, she says, tune in to the Zoo's kiwi cam to get a peek at the funky-looking bird.

"Kiwis have been on the planet for 65 million years, around the time the dinosaurs died out," she remarks. "There aren't many animals we can say that about. I think we have an obligation as stewards of this planet to preserve as much as we can. I hope people think not only about the kiwi, but what they can do in their own backyards to preserve the birds they have at home."

When asked how she handles the work and the worry involved in raising these one-of-a-kind birds, Brader sounds a lot like a mom. "I have a connection to them," she says with a chuckle. "Why do we love the people we love? Why do some people love dogs and others love cats? I love working with all my kiwis. It's just a real privilege. They're in my heart and soul." SZ

— *Freelance writer* KERRY GILDEA BECK *is a volunteer interpreter at the Amazonia exhibit.*

Got Milk?

With more than 5,800 samples of milk to pick from, finding formula for a new baby shouldn't be that difficult. But it can be tricky when the baby's a gorilla, giant panda, or lion.

The Zoo's Department of Nutrition Science houses the largest animal milk repository in the world, and its 14 staff members use data from those milk samples to concoct complicated nursing formulas for practically every mammal at the Zoo. That work starts months in advance of any newborn's arrival.

When it comes to trying out a new formula, "no two animals are the same," says department head Mike Maslanka. If an animal's mother can't provide milk, the staff take on that job, working with hand-rearing teams for each species.

"Ideally, we want an infant to nurse from the mother. But when that's not possible, we have to decide right away if it needs milk or water or something else like Pedialyte," he explains. The team breathes easier as an animal grows. For example, Maslanka notes, the Zoo's seven lion cubs "are golden now because they're on solids," but the nutrition staff was ready if they needed added care.

"We can develop the best formula in the world and what we're doing involves everyone: the vets, curators, keepers, and nutritionists," Maslanka adds.

From the most unusual cases like the little porcupine who wouldn't eat until banana was added to his milk to preparing for the possibility of a new giant panda cub, the staff here are always on call. After all, they have a lot of mouths to feed.

Kenya's Laikipia District is a place where people and animals coexist—and a new frontier for Zoo research.

LIVING

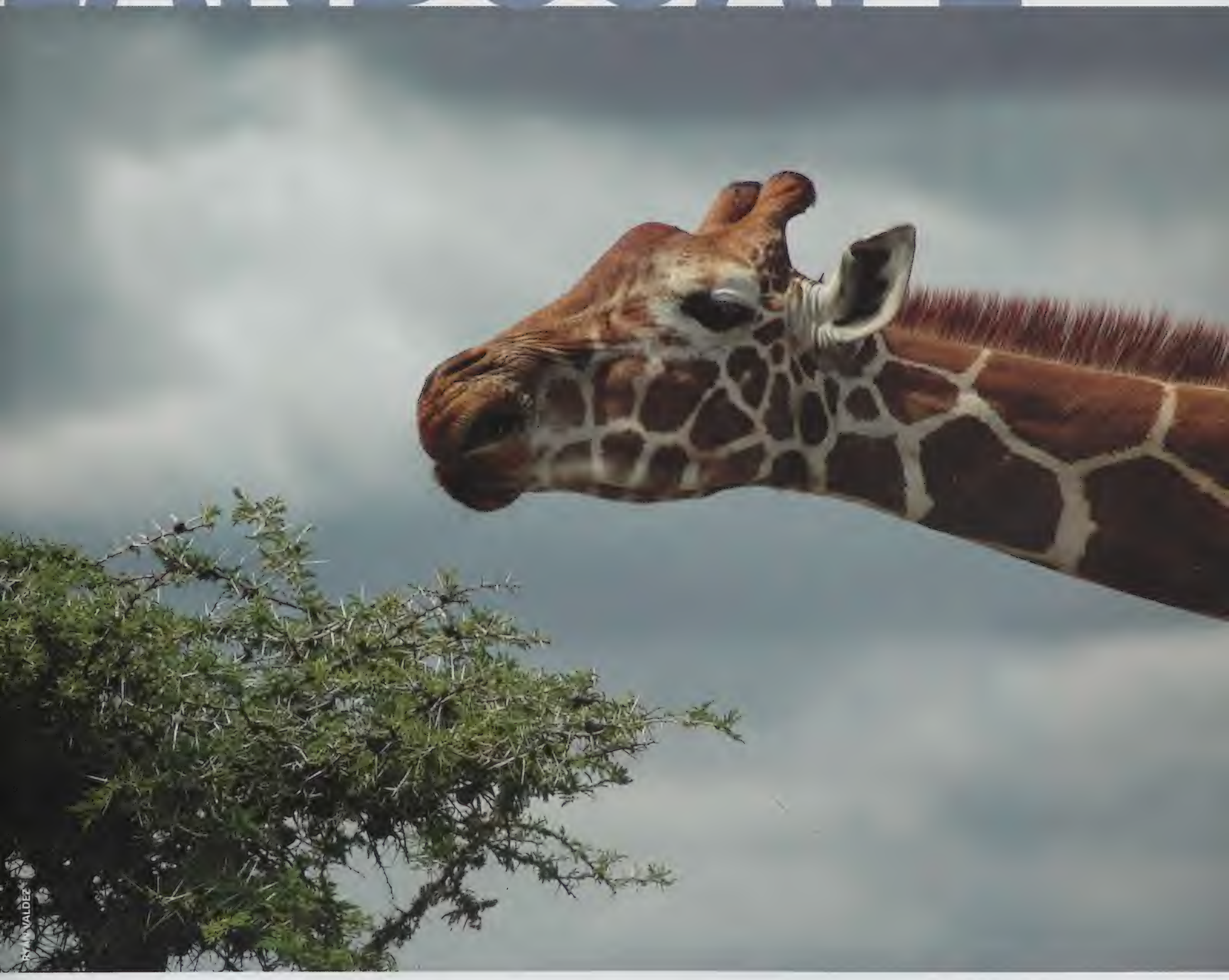
RYAN VALDEZ

Fascination with the creatures around us, whether as food, objects of fear, or sources of wonder, is part of our being human. For thousands of years, that fascination has played out through the impulse to collect animals for viewing. The remains of one menagerie, excavated in Egypt, date back to 3500 B.C.E. It included elephants, hippos, baboons, and antelope known as hartebeests.

Zoos remain popular today, of course. Yet their focus has shifted from merely collecting animals to conserving them. The Smithsonian's National Zoo has been a leader in this effort—launching, last year, the Smithsonian Conservation Biology Institute (SCBI). Its director, Steve Monfort, describes SCBI as "the scientific arm of the Zoo."

BY VALERIE MAY

LANDSCAPE

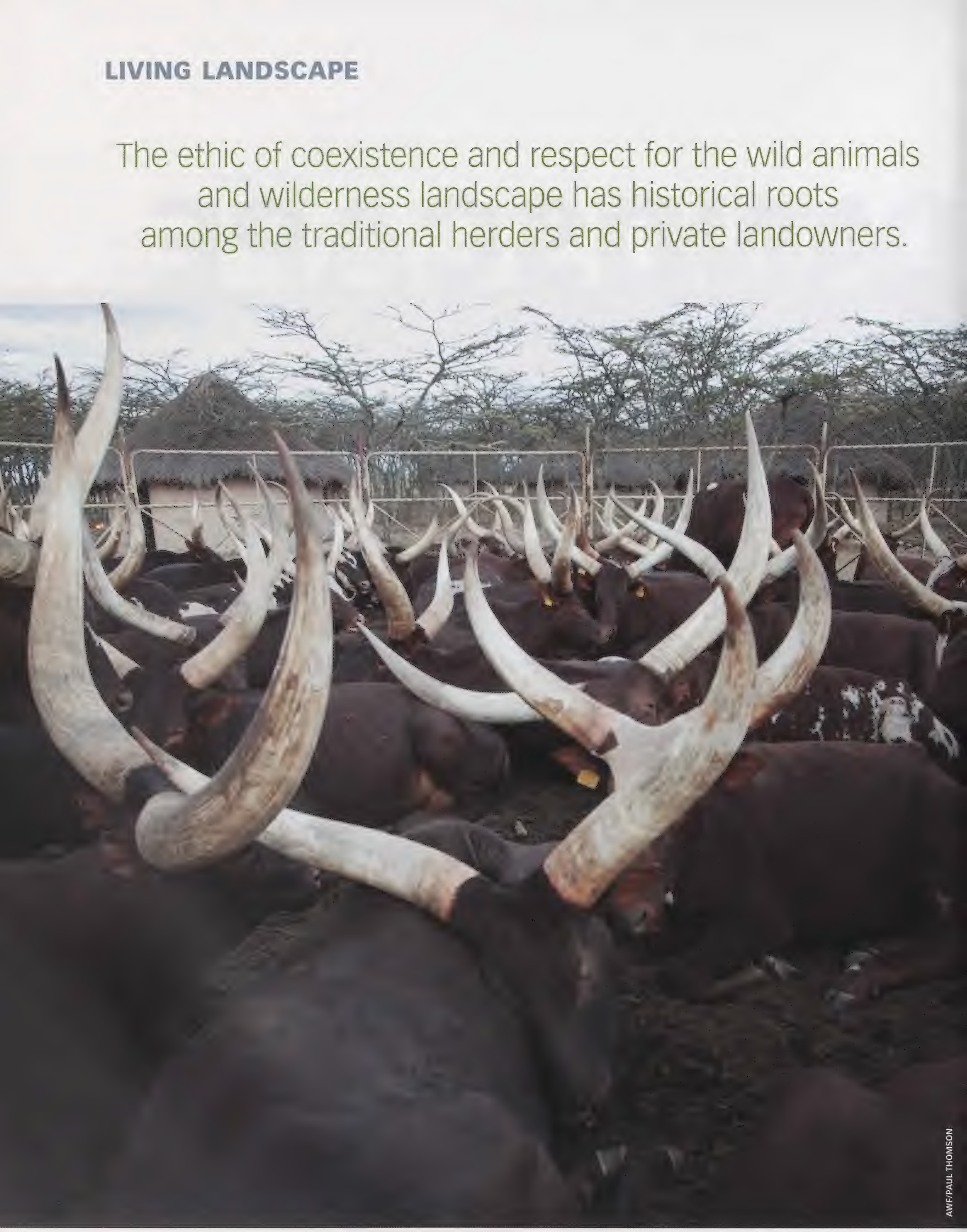


RYAN VALDEZ

SCBI gathered under one umbrella the Smithsonian's global efforts to study and preserve Earth's biodiversity and to train future generations of conservationists. "It is our role," Monfort says, "to bring people together across the Smithsonian in an interdisciplinary manner in the practice of conservation biology."

Conservation biology, Monfort notes, can encompass "a wide spectrum of natural and social sciences," including landscape ecology, wildlife ecology, plant ecology, behavioral ecology, wildlife health and disease, evolutionary biology, conservation genetics, community relations, conflict resolution, livelihood-development programs, educational outreach, and more. Conservation biologists strive not only for the preservation of individual species but for successful maintenance of natural ecosystems.

The ethic of coexistence and respect for the wild animals and wilderness landscape has historical roots among the traditional herders and private landowners.



AWF/PAUL THOMSON

This pioneering work has taken SCBI scientists far beyond the Zoo's gates. "SCBI exists wherever our scientists are working. At the Zoo, at our labs in Front Royal, at field sites in 25 countries," says Monfort. "We are not a location-specific enterprise."

Incredible Place

Today, a doctoral student named Ryan Valdez is taking SCBI's pioneering mindset to a new landscape: the Laikipia District in central Kenya. Laikipia is a like a page out of *National Geographic*. Acacia-studded grasslands spread out against the distant backdrop of Mount Kenya, and Maasai and Samburu pastoralists tend their cattle cheek by jowl with private and tribal ranches, ecotourism lodges, and a research center.

Vast herds of elephants shuffle quietly along centuries-old wildlife corridors. Spectacular, endangered Grevy's zebras share grazing lands with prized cattle. Wild dogs romp beneath acacia trees while reticulated giraffes reach for the highest branches. Lion prides bask in the equatorial sun. This is the landscape that a widely disparate group of people have pulled together to try and preserve.

"It is an incredible place," says Valdez. "You are surrounded by an amazing variety of wildlife. If you were to take my hometown in South Texas and plunk it down in the middle of Kenya, you would still feel right at home among the acacias, grasses, and cattle. But then you have this charismatic wildlife and a terrific group of conservation biologists to work with—like those at the Mpala Research Centre, who have been important mentors for me during my Ph.D. research."

In Laikipia, large quantities of wild animals roam outside protected areas. Unlike traditional conservancies where vast fenced areas are set aside for wildlife, the landscape is largely unfenced and privately owned. "The best way of preserving wildlife here," says Mpala director Margaret Kinnaird, "is to find a way to create a win-win situation for everyone on the landscape." She refers to the wildlife as well as the pastoralists who move herds of cattle across the horizon, the private ranchers who have bred a unique and expensive breed of cattle called "boran," and the nongovernmental organizations that have partnered with traditional pastoralists to create ecotourism lodges as well as ecologically viable and economically fruitful agricultural endeavors, such as honey production.

The ethic of coexistence and respect for the wild animals and wilderness landscape has historical roots among the traditional pastoralists and private landowners. It finds expression in the Laikipia Wildlife Forum. This group comes together regularly to thrash out the complex issues of the day. "You can't look around and say that everybody is wildlife-friendly, but most of them are," Kinnaird says. It's a group dedicated to human-wildlife balance. "We come together to hammer out the issues. It's a lot of hard work to move ahead, but we do." Swahili, English, and Maa are all spoken at the meetings, and typically one sees everything from "beads to blue jeans," says Kinnaird.

Lands in the Laikipia District are managed as vast, working wildlife landscapes, and land stewardship is rooted in science. Research points to the interconnectedness of the entire ecosystem. For example, controlled cattle-grazing supports healthy grasslands and cuts down the rodent population. With fewer rodent hosts, ticks—

AWF/PAUL MUGGA

RYAN VALDEZ

TOP: **Samburu man in traditional garb**
BOTTOM: **Scientist Ryan Valdez flanked by Ol Pejeta Conservancy guards**
FACING PAGE: **Cattle in a *boma*, or enclosure.**

and the diseases they carry—become less widespread.

Laikipia's ecological balance, researchers have found, must include large herbivores. If elephants and giraffes are eliminated from the landscape, for instance, acacia trees stop producing sugar. Sugarless trees fail to attract ants, which protect them from destructive boring beetles. Devoured by beetles, trees die. That, in turn, can have a negative impact on the grasses that cattle need for grazing.

Can a Landscape Recover?

Valdez will study how a "degraded," or heavily used, landscape responds following the cessation of human habitation and cattle grazing. He'll chart changes in both plant and animal life. To do so, he'll compare three adjacent tracts of land in different stages of use.

One locale, the Ol Pejeta Conservancy, has an area that has been largely untouched for more than ten years. "This is the model, the control if you like, of what can become of these degraded lands if you allow them to recover from overuse," says Valdez. "Ol Pejeta has continued to graze cattle there but using a science-based approach that sustains high biodiversity." Ol Pejeta also maintains East Africa's largest black rhino sanctuary and is a center of ecotourism. As a nonprofit, it plows revenue back into the community with various outreach programs.

The second site is the government-owned ADC Mutara Ranch. It includes a 20,000-acre expanse that was set aside for wildlife conservation about two years ago.

The third study area, still to be chosen, will be a degraded landscape, where intense human habitation and overgrazing have destroyed the natural ecosystem. It will be a place where megafauna and predators, such as lions and leopards, have largely disappeared.

An interesting twist here is that most research into maintaining biodiversity concentrates on human impact, such as roads and agriculture, on relatively pristine landscapes. Valdez's work will do the opposite. Can a landscape devoid of wilderness be returned to an ecologically viable property? Can it be recovered and returned to a wilderness that could support ecotourism and sustainable ranching?

Ecological Experiment

Valdez is collaborating with the Mpala Research Centre, of which the Smithsonian is a trustee organization, along with the Kenya Wildlife Service, the National Museums of Kenya, Princeton University, and the Mpala Wildlife Foundation. "We are beginning to explore how we might have a larger role there. We're just dipping our toes in the water with Ryan's research," says Monfort.

Mpala Research Centre supports a well-respected, international research facility with space for about 60 students and scientists. It also operates a cattle ranch that successfully coexists with an abundance of wildlife, runs a primary school for employees' children, and provides several educational fellowship programs as well as a medical mobile clinic as part of its community outreach.

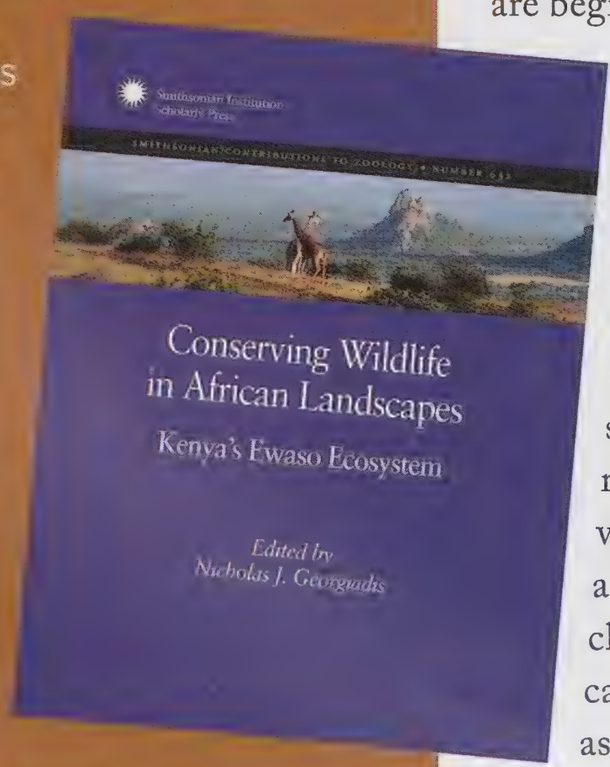
Scott Miller, who represents the Smithsonian on the Mpala board, describes Laikipia as "a big experiment in the coexistence of people, livestock, and wildlife. Historically, it was large, privately held ranches which are now transitioning to multiple land-management models. Much of this is underpinned by the research being done at Mpala."

"There's a great sense of pride by community ranch members in their lands and their wildlife," says Kathleen Fitzgerald, conservation director of the African Wildlife Foundation. Traditionally, wild dogs were considered a menace in Laikipia, killing sheep, cattle, and goats. Now, this region hosts one of the only growing populations on the continent. "I was happy to see the wild dogs," one tribal ranch member told Fitzgerald. "We know that tourists will come to see them."

Grant's gazelles on the savanna

Visions of Kenyan Conservation

This month, the Smithsonian Institution Scholarly Press is bringing forth a new book called *Conserving Wildlife in African Landscapes: Kenya's Ewaso Ecosystem*. A collection of nine papers, the volume reports a shift in conservationists' focus, from saving large mammals in protected areas to conserving whole ecosystems—including the human communities within them. You can learn more at **scholarlypress.si.edu**.



RYAN VALDEZ

This is not to say all goes smoothly all the time. One morning, her voice suffused with the regret of a rancher who has lost a treasured animal, Kinnaird described the killing of a pedigreed boran bull by two lions. "It put a dent in the breeding stock. In the old days, you might have had the manager set out to shoot the lions. But we want our lions too. And that level of tolerance is very special to this region. So instead," she says, "we are buckling down on livestock management."

In this instance, that means paying more attention to the *bomas*, or movable corrals, that are the traditional holding pens for cattle. People at Mpala are experimenting with metal, movable bomas that latch together and are nearly predator-proof. "The really practical thing we do here, says Kinnaird, "is to help traditional pastoralists and ranchers come up with simple solutions."

Success Story?

Laikipia's successes are important, because conservationists largely agree that national parks alone will not do the job of sustaining a viable wilderness. In fact, the majority of Kenya's biodiversity exists outside protected areas. Many see advantages to the vast private lands of the Laikipia District because of the innovative ways they permit people to support themselves in wildlife-friendly ways.

All of the players in this complex landscape are building toward sustainability. This means real pay-off in the day-to-day life of the human inhabitants of Laikipia as well as an upswing of wildlife populations. Kinnaird's research points to a 15 percent increase in overall wildlife numbers. "This is in contrast to the rest of Kenya—especially in the parks and protected areas—where animal numbers have plummeted over the past three decades," she writes.

The Laikipia District has the makings of a success story—all too rare in the world of conservation. Here lies a hopeful example of vastly differing constituencies converging on a common goal. Tribal chiefs, Ph.D. students, conservation workers, research biologists, cattle ranchers— they're all coming together to preserve the wondrous biodiversity and jaw-dropping beauty of this landscape. SZ

— *Freelance writer* VALERIE MAY *is a frequent contributor to the magazine.*

Saving gorillas with cell phones. Now that has a nice ring to it.

Recycle your cell phones and other electronic devices at the National Zoo! Bring them to the Zoo's Visitor Center or Great Ape House and help support conservation programs.

Cell phones and other electronics contain coltan, a mineral found in Africa where gorillas live. Coltan mining has led to a dramatic reduction in gorilla habitat. Recycling old electronics—and only buying new ones when needed—will reduce the need for additional coltan. That helps gorillas in the wild.

Nature is calling,
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Accepted electronics include cell phones and accessories, iPods and MP3 players, handheld game systems, portable GPS units, laptops, e-readers, and portable hard drives.

Answer the call of the wild.

NO, WE ARE NOT ACTUALLY GOING TO PUT YOUR NAME ON AN ELEPHANT!

But by donating to Elephant Trails, you'll receive the next best thing. Contribute $250 or more and have a 4"x 8" brick—with your name on it—installed into the foundation of the ground-breaking Elephant Trails exhibit. Elephant Trails: A Campaign to Save Asian Elephants is a comprehensive breeding, education, and scientific research program designed to help scientists care for elephants in zoos and save them in the wild.

Donate at www.fonz.org/bricks.htm and leave your mark on the Smithsonian's National Zoo today!

All bricks will be installed in the finished Elephant Trails exhibit area. Exhibit completion estimated 2013.

BEAST BITS

Unexpected Eggs

Five years ago, zoo keepers in Europe had something of a shock. Two Komodo dragons that hadn't mated with males produced litters of fertile eggs! Reproducing without a male is called parthenogenesis, and scientists hadn't realized Komodo dragons could do it. The fatherless hatchlings had the same genes as their mothers, but they were all male.

You can see a Komodo dragon at the Reptile Discovery Center.

JESSIE COHEN/ NZP

Healing Honey

You may think of honey as a sweet treat produced by busy bees. Yet the ancient Egyptians used it as medicine. Turns out they were smart to do so, for three reasons. One is that honey sucks out moisture. That can help draw germs out of a wound. The second reason is that honey contains acid. It kills bacteria, which are a kind of germ. Third, honey produces a chemical that kills germs. (It's also found in hydrogen peroxide, which you may have put on a wound.)

You can watch bees buzzing at the Zoo's Pollinarium.

Zoo Clue

JESSIE COHEN/ NZP

This golden mane doesn't belong to a lion. Its owner lives in South America and hangs out in the rain forest. Learn more at **nationalzoo.si.edu/goto/zooclue.**

CREATURE FEATURE

You Call That a Dog?

BY PAMELA BUCKLINGER

Arf! Arf!

It barks like a dog. It stands guard like a dog. Yet the prairie dog is not actually a dog. It's a rodent that belongs to the same family as the squirrel.

Beware of Dog

When a prairie dog has guard duty, it stands on top of its mound. That's a dirt pile that leads down into a tunnel. It keeps its eyes open for predators. If the prairie dog spots something dangerous, it barks a loud warning. Then all the other prairie dogs dive into a nearby tunnel for cover.

Dog Town

Can you imagine having a thousand roommates? Prairie dogs do. Thousands of prairie dogs can live together in a town. That's an underground system of tunnels. Just as we do, prairie dogs have rooms for sleeping, eating, and going to the bathroom. They even have a room where they can listen for sounds above. The tunnels protect them from the strong sun, the bitter cold of winter, and any animals that might want to eat them for dinner.

Prairie Home Companions

Prairie dogs are great neighbors. They build more tunnels than they actually need. That creates homes for salamanders, rabbits, and many other animals. Also, the scoop on prairie dog poop is that is makes the soil rich, which helps grass grow.

Prairie Problems

Animals that make their homes in the prairie are in danger these days. People have taken over much of the land to graze sheep and cattle or to grow crops. Some of these people consider prairie dogs pests. That's because the rodents eat the grass that cows need to survive. As prairie dogs vanish, problems arise for other animals too. Black-footed ferrets, for example, are endangered.

Ferret Foe

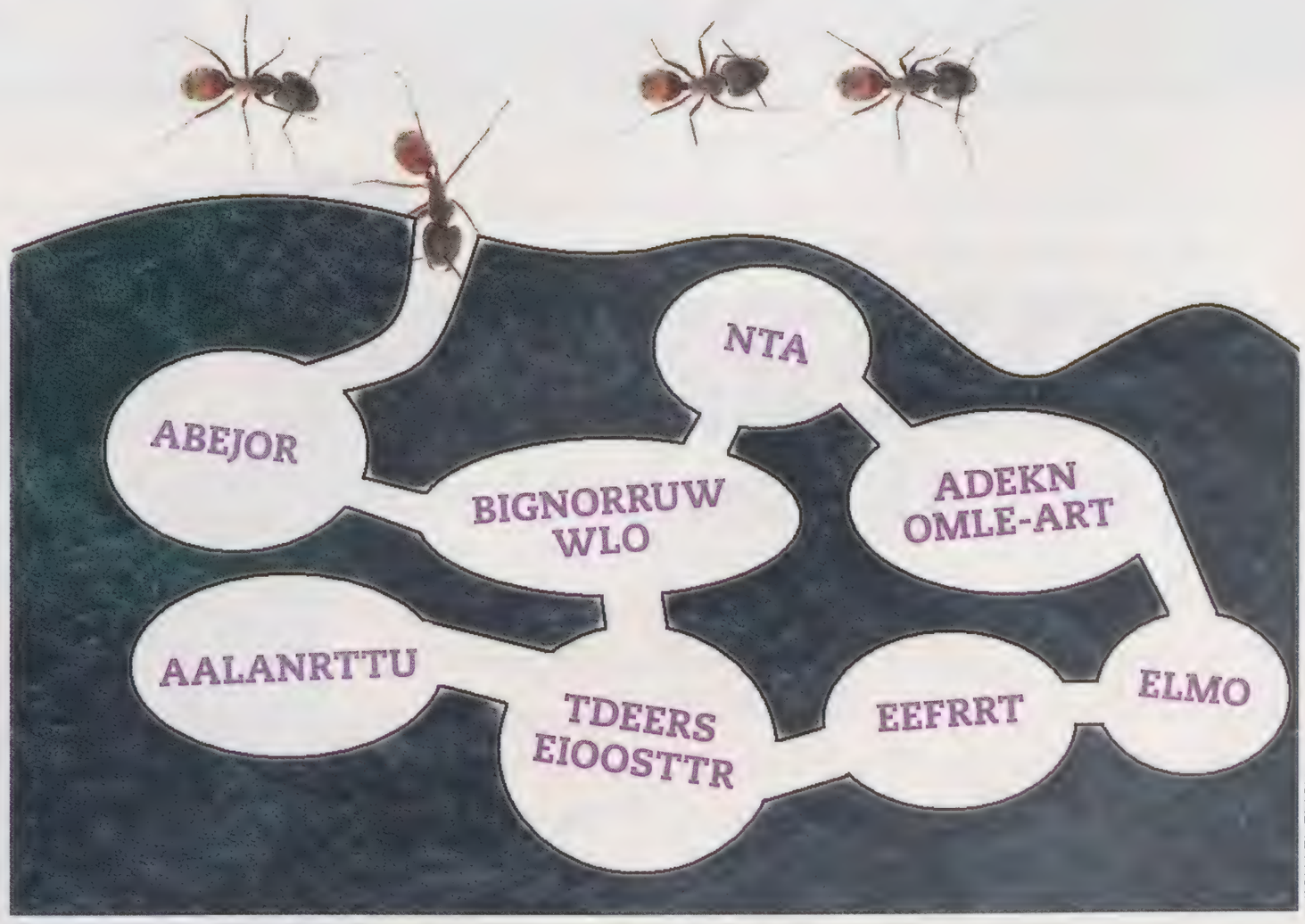
One of the many animals that share the prairie is the black-footed ferret. A member of the weasel family, it's the only ferret native to North America. Black-footed ferrets live only in prairie dog towns. The ferrets hunt the dogs for food.

At the Zoo

You can get up close and personal with prairie dogs at our outdoor exhibit, located near Lemur Island. Then you can check out our prairie-dog-themed playground, designed for children ages 2-6. Kids can crawl through tubes that resemble prairie dogs' underground tunnels.

YOUR TURN
Going Underground

Like prairie dogs, many other animals live underground. Meet some of them by unscrambling the words at right. (Note: These animals don't all live in the same place.)



ANSWERS: **ant, burrowing owl, desert tortoise, ferret, jerboa, mole, naked mole-rat, tarantula**

ANN BATDORF/NZP

MICHAEL FRICK

SMITHSONIAN Zoogoer kids CORNER

ZOO CREW

Home Maker

MEHGAN MURPHY/NZP

Peer through some windows in the Zoo's Reptile Discovery Center (RDC), and you may feel like you're entering another world—far away from Washington, D.C. "It takes a lot of work" to create an exhibit like that, says Matt Evans. He's a biologist for RDC. Evans and others at the Zoo put a lot of thought and effort into creating terrariums, or enclosed homes, for animals. They try to make them as natural and comfortable as possible.

Before Evans can begin building a terrarium for an animal, he needs to know certain things about it. "I'm definitely paying attention to where it comes from," he explains. An animal's natural habitat is like the blueprint for the terrarium. What's the landscape like? How hot is the environment? How humid is it? Those are all questions Evans tries to answer.

Waterworks

What if an animal needs running water in its terrarium? It is Evans's job to figure out how to make that happen. If a terrarium has running water, it has to have a plumbing system as well to keep the water clean.

Some animals, such as frogs, need mist in the air. That poses a challenge. A misting system can be very important to a frog's health, but it can also be hazardous if it is not set up correctly. The tiny water droplets that make up the mist need a place to drain, or else they will make the soil soggy.

"If you have got soggy and mushy soil, then bacteria can grow in there, and that can get the frogs sick," explains Evans. He avoids any moisture buildup by placing rocks underneath soil. That creates a natural drainage system.

Frog Furniture

Terrariums also have "furniture"—rocks, plants, and soil. These items encourage the animal to act as it would in the wild. They also mean more work for Evans and his colleagues. Evans can't just grab any old soil, rock, or plant. He works with the Zoo's horticulture team to get just the right materials. "I like to use a lot of live plants," he says.

Finding the right furniture is just a start, however. "You have to make sure all of your terrarium furniture will be disinfected," says Evans. He rinses all of the soil, plants, and rocks that will be placed in a terrarium. He also treats plants with a special bleaching solution to kill any bacteria or fungus on them.

It may sound harsh, but Evans says that most plants can take the mild bleaching. He then lets them dry and places them under a heat lamp just to be sure nothing goes into the terrarium that will make a frog sick. After everything is disinfected, the terrarium can finally be completed. Then the animal can move into its new, comfy, natural-looking Zoo home.

—Devin Murphy

MEHGAN MURPHY/NZP

ROCK-N-ROAR

Sponsored by **CAPITAL ONE BANK**

the B-52s AT THE ZOO

Wednesday, August 10, 7:00 p.m.

Dance the night away with the World's Greatest Party Band! Rock to the tunes of the B-52s while enjoying the roar of the crowd on Lion/Tiger Hill at the Smithsonian's National Zoo. VIP tickets to the Whole Foods Love Shack will be available and include reserved front-row seating and a special viewing of the Zoo's lion pride. Get details and tickets at fonz.org/rocknroar.htm. *Generously sponsored by Capital One Bank, Metromix, MIX 107.3 - WRQX, and Whole Foods Market.*

Capital One Bank is a proud partner of the Smithsonian's National Zoo.

FONZ RESOURCES

fonz.org

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202.633.2922

Special Events
202.633.4470

Development Office
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Camps and Classes
202.633.4470

Volunteer Services
202.633.3025

Comments? Questions?
Please email us at
fonzmember@si.edu

Not a FONZ member yet?
Call 202.633.3034
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fonz.org/join.htm

Thanks to Our ZOOFARI Superstar Restaurants!

FIVE-STAR SUPPORTERS

These restaurants helped promote ZooFari and contributed items to the auction.

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FOUR-STAR SUPPORTERS

These restaurants helped us promote this successful event.

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For a complete list of the 100-plus ZooFari restaurants, please visit **Fonz.org/ZooFariRestaurants.htm.**

Learn at the Zoo!

FONZ classes give children a deeper understanding of animals, their behaviors, and their habitats. Children's classes are open to FONZ members at the household level or higher.

Varying somewhat in structure, classes generally include hands-on activities, crafts, and time in the Zoo. Please note that classes do not include behind-the-scenes visits or direct contact between children and animals. Classes meet in the Visitor Center unless otherwise noted.

Register online at
fonz.org/classes.htm.

JESSIE COHEN/NZP

PRESCHOOL CLASSES

These programs invite adults and children to discover the Zoo together. All children must be accompanied by an adult. For everyone's safety and enjoyment, unregistered children and siblings may not attend—except for infants who do not yet crawl.

TEDDY BEAR PICNICS

We can bear-ly contain the excitement! Join us (with your favorite plush animal) for a month where we celebrate bears. Make crafts and play games as we spend time with the Zoo's three bears: sloth, Andean, and panda. After each class, gather with your friends for a teddy bear picnic. (Please bring snacks.) It would just be unbearable if you missed out, so sign up for one or all today!

AGES: 2-3
DATES: Sept. 4, 11, 18, 25
TIME: 10-11:30 a.m.
FEE: $25 per class or $88 for all four

Note: Please bring snacks to share at the picnic each week.

Sept. 4: Sloth Bears — Pack your plush pal and take a hike on Asia Trail to visit the sloth bears! But don't you worry: There will be nothing slow about this class.

Sept. 11: Andean Bears — Bring your favorite fuzzy friend and come learn about South America's only bear species. Meet the newest members of the Zoo's bear family, our Andean bear cubs. They're sure to be quite a spectacle!

Sept. 18: Giant Pandas — It's panda-monium! Spend the day with Mei Xiang and Tian Tian, the National Zoo's giant pandas! Make black-and-white crafts and learn about these bamboo-eating bears.

Sept. 25: Paging Dr. B. Ear! — Bring your cuddly companion for a bear-y special day at the Zoo! Give your plush a check-up in the How Do You Zoo? exhibit and learn about the Zoo's veterinarians.

JESSIE COHEN/NZP

DR. ZOO-EUSS

Turtles and elephants. Big tigers too. Where can you find them? The National Zoo! You're sure to have a fabulous time—making crafts, enjoying rhyme. Then you'll go and have a look at creatures from a Dr. Seuss book.

AGES: 2-3
DATES: Session 1:
Sept. 12, 19, 26; Oct. 3, 10
Session 2:
Sept. 13, 20, 27; Oct. 4, 11
Session 3:
Sept. 14, 21, 28; Oct. 5, 12
Session 4:
Sept. 15, 22, 29; Oct. 6, 13
Session 5:
Sept. 16, 23, 30; Oct. 7, 14
TIME: 10-11:30 a.m.
FEE: $125

MEHGAN MURPHY/NZP

CHILDREN'S CLASSES

Parents are not encouraged to stay with the class, but may if they wish (for no charge).

THE ZOO-CREDIBLES!

Find the nearest phone booth and change into your cape. We're meeting the Zoo's most incredible creatures! Join the squad as we uncover animals with powers of speed, strength, and flight. Then transform into a hero yourself.

AGES: 4-6
DATES: Sept. 3, 10, 17
TIME: 10 a.m.-12 p.m.
FEE: $28 each or
$75 for all three

Sept. 3: Faster Than a Speeding Bullet — Spend the day learning about the world's fastest land animals, cheetahs! These cool cats are so fast, they appear as blurs! Can you spot them?

Sept. 10: More Powerful Than a Locomotive — Expect big things out of this class! Spend the day with Shanthi, our 9,000-pound Asian elephant and the largest animal at the National Zoo!

Sept. 17:Able to Leap Tall Buildings in a Single Bound! — Look to the skies! It's not a plane. It's not Superman. They're birds! Explore the world of our high-flying friends, then go for a bird watch to see some for yourself.

HOMESCHOOL CLASSES

Attention all home educators! Start planning the new school year by booking your Zoo activities. We're taking reservations now for September through December. Visit our website at **fonz.org/classes.htm** for more information, then contact us at **fonz_programs@si.edu** if you are interested in setting up an educational program that can meet your specific needs.

MEHGAN MURPHY/NZP

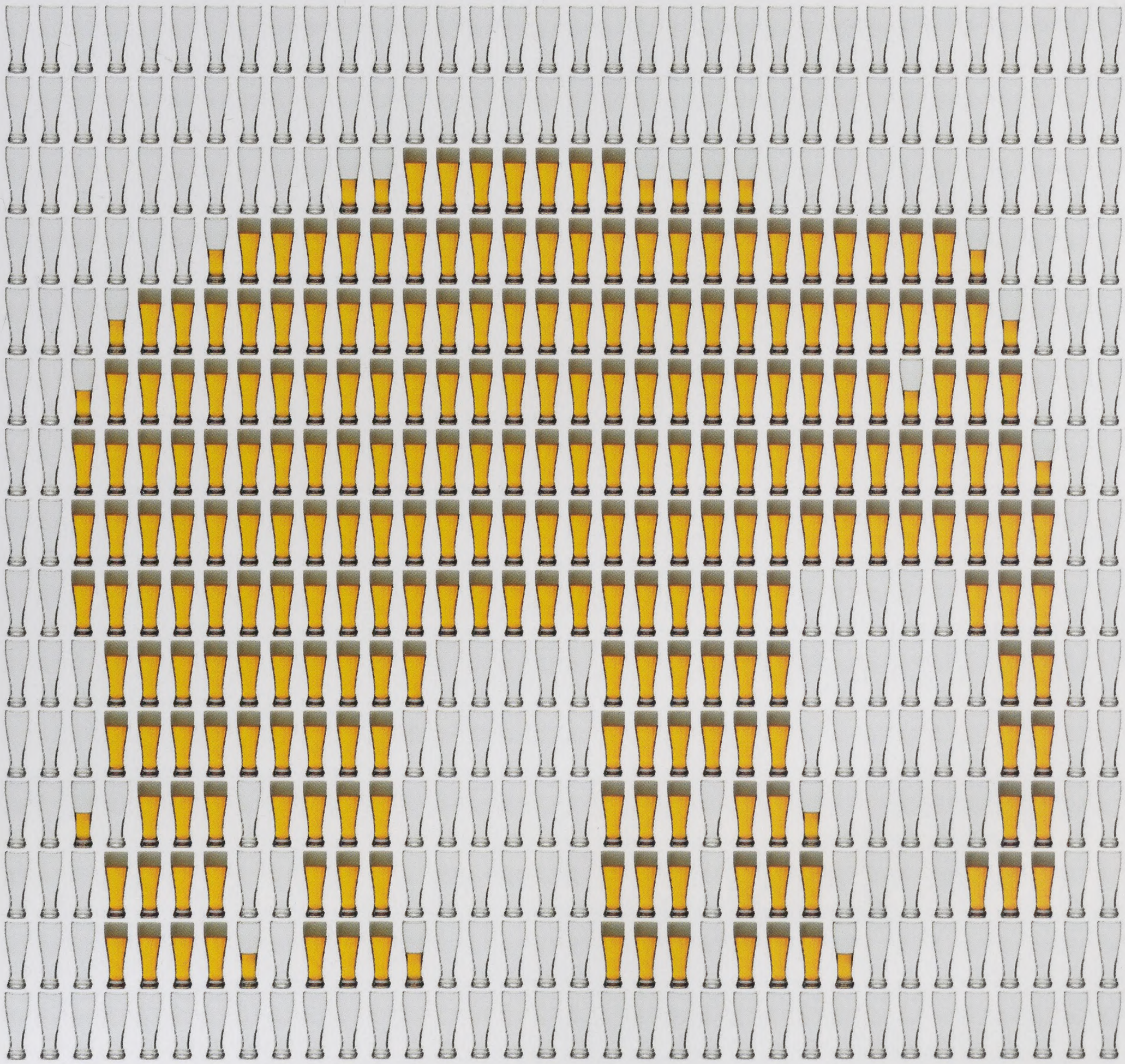
MEHGAN MURPHY/NZP

Meet Our New Tiger!

Damai, a two-and-a-half-year-old female Sumatran tiger, came to the Zoo from the San Diego Safari Park and went on exhibit in late May, when Zoo photographer Mehgan Murphy captured this shot. Keeper Leigh Pitsko describes Damai as "sweet, very calm, and curious about everything going on around her."

Technical Notes — CAMERA: Canon EOS 1D Mark III; FOCAL LENGTH: 320 mm; EXPOSURE: 1/80 second at f/6.3

Smithsonian Zoogoer welcomes FONZ members' submissions of photos taken at the Zoo. Please send photos to **Zoogoer@si.edu**. We will contact you if we are able to use your picture for the Zoo View page.



Changing the world, one beer at a time.

Join us on July 14 for Brew at the Zoo and get a buzz from supporting a good cause! At Brew at the Zoo, you can try samplings from 30 breweries while rocking to live music, all in the beautiful setting of the National Zoo. Proceeds support the Zoo's conservation programs. Order tickets at fonz.org/brew.htm and head to the National Zoo, where drinking beer helps save wildlife.

This is a 21+ rain–or–shine event. Generously sponsored by United Airlines and Dave & Busters.

BREW·AT·THE·ZOO

JULY 14, 6-9 P.M.

FONZ
Friends of the National Zoo

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Smithsonian
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Your membership supports animal care, science, conservation, and more.